Effects of daily supplementation with high dose ascorbic acid on lead levels in broiler chicken after intentional exposure to a concentrated source of lead

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Abstract :

The present study was conducted to determine the amount of lead deposited in chicken blood, eggs and tissues after exposure to a concentrated source of lead for 1 week and to determine the effect of 4 week daily supplementation with high dose ascorbic acid on the levels of lead in blood, eggs and tissues. Ten clinically normal mixed-breed adult laying chickens were used. Chickens received lead acetate (200 mg/kg/day) for 1 week. A group of chicken received ascorbic acid (500 mg/kg/day) for 4 weeks and another group did not receive any treatment. Blood, eggs and tissues were collected and analyzed for lead contents using a graphite furnace atomic absorption spectrophotometer. The baseline blood lead level was 47.5 ± 38.0 µg/L and increased significantly to 2755 ± 576 µg/L after 1 week of lead acetate treatment ($P < 0.001$). Ascorbic acid treatment reduced blood lead levels significantly ($P < 0.05$). Similarly, ascorbic acid reduced lead levels in ovaries, liver, eggshell, albumen, and yolk by 3, 2, 2.8, 6.8, and 2.2-fold, respectively. Ascorbic acid reduced concurrent elevated lead levels in chicken tissues and eggs. Supplementing feed with daily high doses of lead might protect from lead exposure when chickens are exposed to environmental lead pollution.

Key words: Ascorbic acid, lead, pollution, chicken, eggs